## CLAIMS

We claim:

1. An apparatus for aligning optical fibers within an inner perimeter of a cavity comprising:

a plurality of flexible protrusions extending inwardly from said inner perimeter of said cavity to contactingly engage an optical fiber inserted into said cavity;

wherein said protrusions are substantially uniformly deformed by the insertion of said optical fiber into said cavity to align said optical fiber therein.

2. The apparatus of Claim 1, wherein each of said plurality of protrusions comprise a flange having an arm and a lip.

3. The apparatus of Claim 1, wherein said plurality of protrusions are spaced from each other at a distance smaller than the diameter of said optical fiber.

4. The apparatus of Claim 1, wherein said plurality of protrusions are tapered along said cavity.

5. The apparatus of Claim 1, wherein said plurality of protrusions extend the entire length of said cavity.

6. The apparatus of Claim 1, wherein said plurality of protrusions are tapered along said cavity from a spacing less than the diameter of said optical fiber to a spacing greater than the diameter of said optical fiber.

7. The apparatus of Claim 1, wherein said protrusions are formed by the creation of said cavity.

8. An apparatus for aligning optical fibers in relation to the inner perimeter of a cavity comprising:

a plurality of flexible flanges extending inwardly from said inner perimeter of said cavity, said flanges having a arm and a lip, wherein said flange lip contactingly engages said optical fiber as it is inserted into said cavity;

wherein said flexible flanges are substantially uniformly deformed by the insertion of said optical fiber into said cavity to align said optical fiber therein.

9. A method of aligning optical fibers within an inner perimeter of a cavity comprising the steps of:

creating a plurality of protrusions extending inwardly from said inner perimeter of said cavity;

inserting an optical fiber into said cavity to contactingly engage said protrusions;

and

fully inserting said optical fiber into said cavity to substantially uniformly deform said protrusions to align said optical fiber within said cavity.

10. The method of Claim 9, wherein said protrusions comprise a flange having an arm and a lip.

11. The method of Claim 9, wherein said plurality of protrusions are spaced apart from each other at a distance smaller than the diameter of said optical fiber.

12. The method of Claim 9, wherein said plurality of protrusions are tapered along said cavity.

13. The method of Claim 9, wherein said plurality of protrusions extend the entire length of said cavity.

14. The method of Claim 12, wherein said plurality of protrusions are tapered along said cavity from a spacing less than the diameter of said optical fiber to a spacing greater than the diameter of said optical fiber.

15. The method of Claim 9, wherein said protrusions are formed by the

creation of said cavity.

16. A method of creating an apparatus for aligning optical fibers in a substrate comprising the steps of:

applying a mask to said substrate, said mask being shaped as having a plurality of protrusions extending inwardly from an inner perimeter of a cavity; and

etching said substrate to create a plurality of protrusions extending inwardly from an inner perimeter of a cavity in said substrate;

wherein said protrusions and said cavity are sized to substantially uniformly deform to align to an optical fiber inserted within said cavity.

17. The method of claim 16, wherein said etching is accomplished using an RIE process.

18. The method of claim 16, wherein said process is accomplished using photolithography.

19. The method of claim 16, wherein said protrusion comprises a flange having an arm and a lip.

20. The method of claim 16, wherein said protrusions are tapered along said

cavity from a spacing less than the diameter of said optical fiber to a spacing greater than the diameter of said optical fiber.